



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/386,646	08/31/1999	PIERRE C. FAZAN	660073.488D1	1639

27076 7590 12/03/2003

DORSEY & WHITNEY LLP
INTELLECTUAL PROPERTY DEPARTMENT
SUITE 3400
1420 FIFTH AVENUE
SEATTLE, WA 98101

EXAMINER

VU, HUNG K

ART UNIT PAPER NUMBER

2811

DATE MAILED: 12/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/386,646

Applicant(s)

FAZAN ET AL.

Examiner

Hung K. Vu

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 44-68 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 44 - 52 and 61 - 68 is/are allowed.
- 6) ☒ Claim(s) 53, 55-58 and 60 is/are rejected.
- 7) ☒ Claim(s) 54 and 59 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Request for Continued Examination

1 A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on 09/10/03 has been entered. An action on the RCE follows.

Claim Objections

2. Claim 1 is objected to because of the following informalities: In claim 1, line 6, "the first gate structure" should be changed to "the gate structure" for clarity. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 55 and 60 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Application/Control Number: 09/386,646
Art Unit: 2811

In claims 55 and 60, lines 3 - 5, it is unclear as to what "a having second thickness" being referred to.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 53 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al. (PN 5,296,400, of record) in view of Poppert et al. (PN 4,593,459, of record).

Park et al. discloses, as shown in Figures 1F and 2H, a microelectronic device comprising:

a microelectronic substrate (1);

a gate oxide layer (4) formed on the substrate;

a polysilicon gate layer (lower portion of 5) formed on the gate oxide layer;

a field oxide (3) having a field oxide level between the level of an upper surface of the substrate and the level of an upper surface of the polysilicon gate layer.

Park et al. discloses the field oxide is a LOCOS. Park et al. does not disclose the field oxide is a trench isolation. However, Poppert et al. discloses a microelectronic device comprising a trench isolation (46,47). Note Figure 10 of Poppert et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the field oxide of Park et al. by trench isolation, such as taught by Poppert et al. in order to prevent the bird-beak effect and further isolate the devices from each others.

With regard to claim 56, as shown in Figures 1F and 2H, Park et al. discloses a microelectronic device comprising:

- a microelectronic substrate (1);
- a gate oxide layer (4) formed on the substrate;
- a polysilicon gate layer (lower portion of 5) formed on the gate oxide layer;
- a field oxide (3) having a field oxide level between the level of an upper surface of the substrate and the level of an upper surface of the polysilicon gate layer;
- a polysilicon adhesion layer formed over the polysilicon gate layer and the upper surface of the field oxide.

Park et al. discloses the field oxide is a LOCOS. Park et al. does not disclose the field oxide is a trench isolation. However, Poppert et al. discloses a microelectronic device comprising a trench isolation (46,47). Note Figure 10 of Poppert et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the field oxide of Park et al. by trench isolation, such as taught by Poppert et al. in order to prevent the bird-beak effect and further isolate the devices from each others.

5. Claims 57 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al. (PN 5,296,400, of record) in view of Poppert et al. (PN 4,593,459, of record) and further in view of Lin et al. (PN 5,318,924, of record).

Park et al. and Poppert et al. discloses the invention substantially as claimed including the microelectronic device as recited in the rejection above. Park et al. and Poppert et al. do not disclose the device further comprising a silicide layer formed on the adhesion layer. However,

Application/Control Number: 09/386,646

Art Unit: 2811

Lin et al. discloses a silicide layer (32) formed on the adhesion layer (26). Note Figure 6 of Lin et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the device of Park et al. and Poppert et al. having a silicide layer on the adhesion layer, such as taught by Lin et al. in order to further reduce the contact resistance.

With regard to claim 58, Park et al., Poppert et al. and Lin et al. discloses the silicide comprising titanium silicide. Park et al., Poppert et al. and Lin et al. do not disclose the silicide layer comprises tungsten silicide. However, at Col. 4, lines 44-49, other refractory metals can be used in place of titanium. It is well-known that other refractory metals include tungsten. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute titanium with tungsten, since titanium and tungsten are both considered to be an art recognized functional equivalent as the refractory metal silicide material for semiconductor device.

Allowable Subject Matter

6. Claims 54 and 59 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claims 44 - 52 and 61 - 68 are allowed.

8. The following is an examiner's statement of reasons for allowance:

Application/Control Number: 09/386,646

Art Unit: 2811

Applicant's claims 44 – 52, 54, 59 and 61 – 68 are allowable over the references of record because none of these references disclose or can be combined to yield the claimed device comprising the second gate layer for the portion of the component structure formed on the isolation pad having a second height relative to the surface of the substrate surface less than the first height, as recited in claim 44, in combination with the remaining claimed limitations, the second gate layer for the portion of the component structure formed on the isolation pad having a second thickness greater than the first thickness, as recited in claim 49, in combination with the remaining claimed limitations, the polysilicon adhesion layer having an upper surface over the upper surface of the field oxide below the upper surface of the polysilicon adhesion layer over the polysilicon gate layer, as recited in claims 54 and 59, in combination with the remaining claimed limitations

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung K. Vu whose telephone number is (703) 308-4079. The examiner can normally be reached on Mon-Thurs 6:00-3:30, alternate Friday 7:00-3:30, Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The Central Fax Number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Application/Control Number: 09/386,646
Art Unit: 2811

Vu

November 24, 2003

Hung Vu

Hung Vu

Patent Examiner